

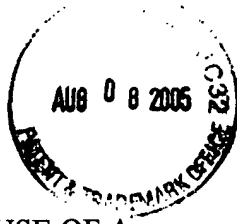
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Johnnie R. Roberts et al.

Application No.: 09/916611

Filed: July 22, 2005

For: **MANUFACTURE AND USE OF A  
HERBICIDE FORMULATION**



Confirmation No.: 8709

Art Unit: 1616

Examiner: A. N. Pryor

**37 CFR 1.132 DECLARATION**

1. I am one of the inventors of the above referenced application. I am employed by Helena Chemical Company as a Manager of the Product Development Laboratory in Memphis, Tennessee. A copy of my most recent Curriculum Vitae is attached as Appendix A. In view of the above qualifications, I consider myself an expert in the field of agricultural compositions.

2. I have reviewed the office action which was mailed on November 30, 2004. The examiner has rejected the claims based on composition of AF-300. I have also reviewed and am familiar with AF-300 along with the above identified application.

3. The composition of AF-300 is found on their Material Safety Data Sheet ("MSDS"). MSDS sheet, dated January 2002 (see Appendix 1).

This MSDS sheet shows the following composition:

2,4-Dichlorophenoxy acetic acid at 300 grams per liter  
Synthetic ethoxylated alcohol at 50%  
Solvent 400 at 235 grams per liter.

4. According to the MSDS sheet for AF-300, Solvent 400 is kerosene. According to the online chemical reference at <http://chem.sis.nlm.nih.gov/chemidplus> the CAS number used on the AF-300 MSDS sheet (68439-46-3) is also known as Neodol 91-6. (See Appendix 2).

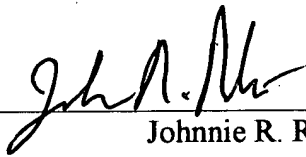
5. The formula was reproduced from the AF-300 MSDS sheet. This formula (A) contained 300 grams per liter of 2,4-D acid, 235 grams of kerosene (or Solvent 400), and 50% by volume of Neodol 91-6. After addition of the Solvent 400 and Neodol 91-6, the solution was clear. After the addition of 2,4-D acid, the formulation became cloudy with chunks of 2,4-D technical dispersed. After 1 hour of stirring at ambient, there was still a substantial amount of undissolved 2,4-D acid in the sample. After an additional 15 minutes of stirring with temperature ramped up to 48 degrees C, the formulation was still hazy with undissolved chunks of 2,4-D acid. After another 15 minutes of stirring and ramping to temperature up to 70 degrees C (dangerous in the presence of Solvent 400), the solution finally cleared and the 2,4-D was solubilized. After 30 minutes of cooling, however, the temperature dropped to 37 degrees C and the solution was hazy again with the 2,4-D coming out of solution. For this reason, this would not be considered a viable formulation.

6. The formula from our Example 1 of the patent application was reproduced. It contained 85% of a C11 alcohol with 3 moles of ethylene oxide, and 15% 2,4-D acid. After the addition of the 2,4-D acid to the ethoxylated alcohol, the formulation became cloudy with chunks of 2,4-D technical dispersed. After 30 minutes of stirring at ambient temperature, the formulation was clear and the 2,4-D acid was fully solubilized.

7. Photos of the formulations are provided in an attached Powerpoint presentation.

8. I hereby declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

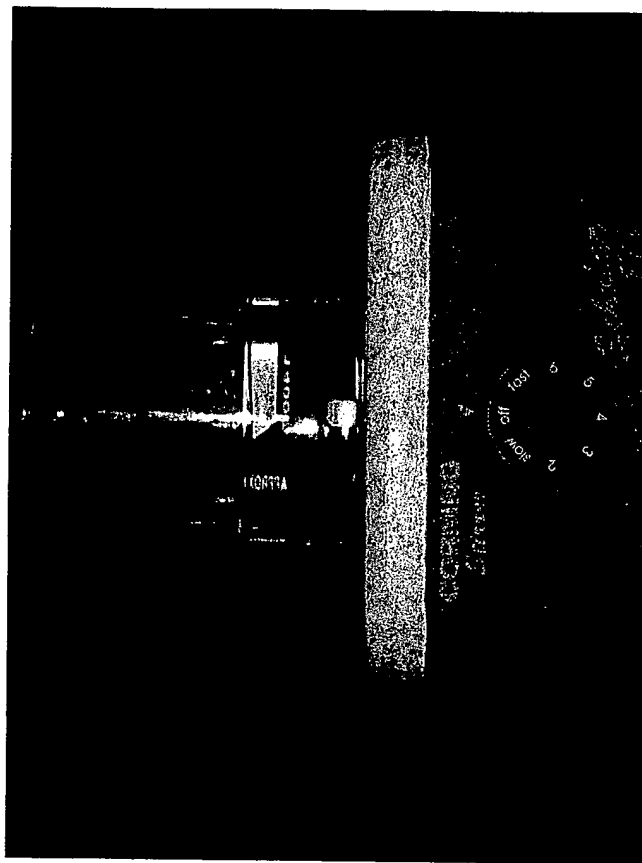
7-22-05  
Date

  
Johnnie R. Roberts

# Formulations with liquids only added

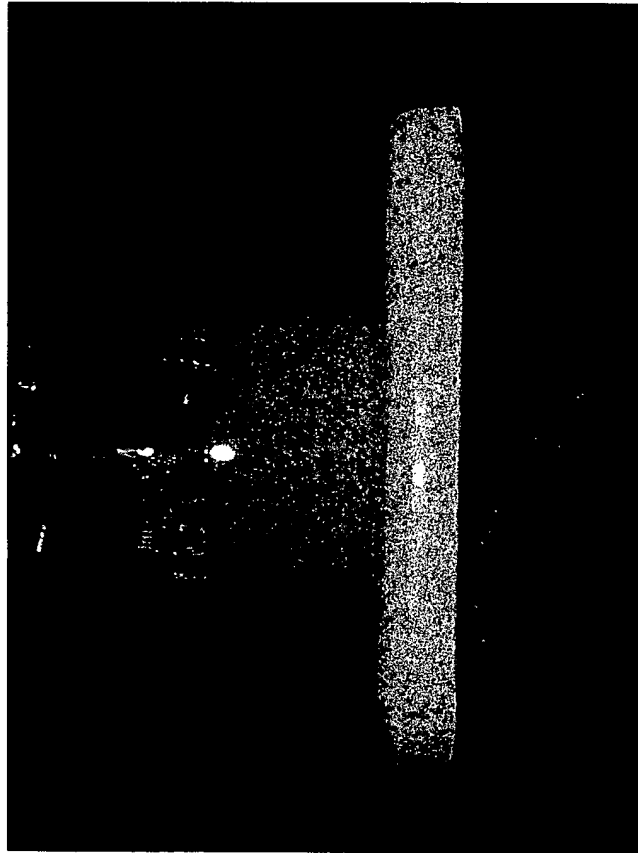


Formula A (AF-300)

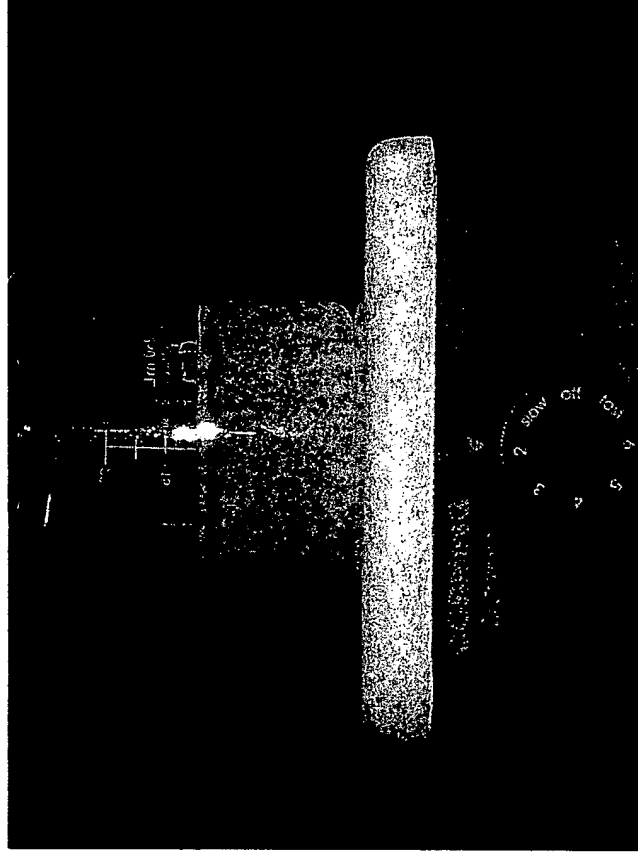


Formula B (HCC Example 1)

# Formulations with 2,4-D Acid added



Formula A (AF-300)



Formula B (HCC Example 1)

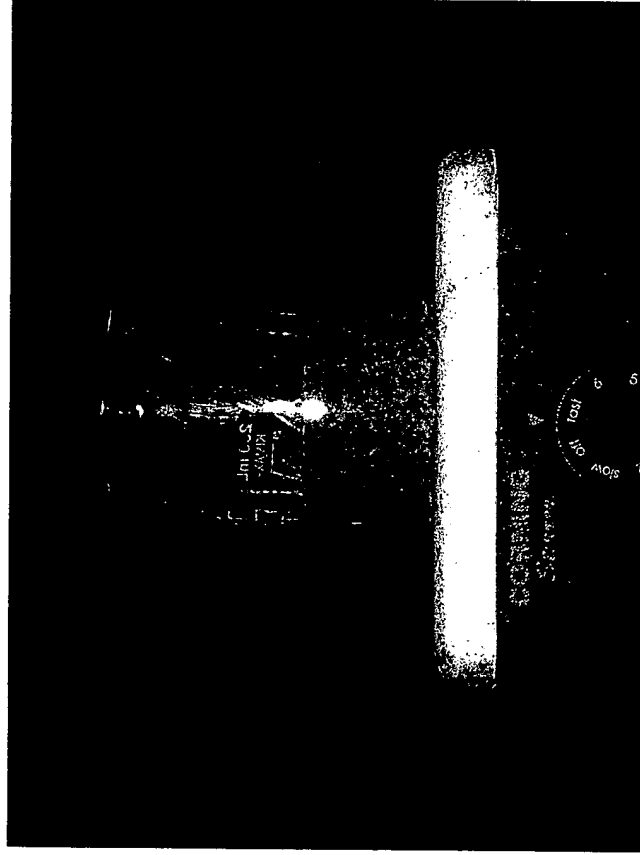
Formulation After Additional 30  
minutes with Temp ramped to 70  
degrees C



Formula A (AF-300)

Best Available Cop,

Formulation After Additional 15  
minutes with cooling to  
37 degrees C



Formula A (AF-300)

Best Available Copy

## Curriculum Vitae

Johnnie Roberts

July 22, 2005

**Current job title with Helena Chemical Company:** Director of Product Development and Technical Services

**Education:** Bachelor of Arts Degree with a Major in Chemistry – University of Tennessee – Martin

**Job experience:** 30 years experience in the formulation and development of Pesticide and Spray Adjuvant Products

**Professional certification:** Certified Crop Consultant: (CCA) 2000 – 20005

**Publications:** Co-Author of 10 Scientific papers dealing with the formulation and/or application of pesticides and spray adjuvants

**Inventor of Record for the following patents:**

PAT. NO.	Title
6,831,038	<u>Agricultural formulation</u>
6,541,424	<u>Manufacture and use of a herbicide formulation</u>
RE37,313	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
6,232,272	<u>Manufacture and use of herbicide chlorinated phenoxy formulation</u>
5,906,961	<u>Alkanolamide spreader-sticker surfactant combination</u>
5,877,112	<u>Agricultural formulation</u>
5,741,502	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
5,725,630	<u>Dry granular fertilizer blend and a method of fertilizing plants</u>
5,580,567	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
5,393,791	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
5,234,919	<u>Water soluble, highly active dimethoate formulations in an alcohol/ester solvent system</u>
5,178,795	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>





# Material Safety Data Sheet

Page: 1 of 5

Infosafe No. NU003 Issue Date : January 2002 ISSUED by NUFARM  
Product Name : AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

## COMPANY DETAILS

Company Name NUFARM AUSTRALIA LIMITED. (ABN 80 004 377 780)  
Address 103-105 Pipe Road Laverton North  
Victoria 3026 Australia  
Emergency Tel. 24hr 1800 033 498  
Tel/Fax Tel: (03) 9282-1000 Fax: (03) 9282-1001

## Other Information

## IDENTIFICATION

Product Code 0027  
Product Name AF300 Herbicide  
Proper Shipping Name FLAMMABLE LIQUIDS, N.O.S. - (2,4-dichlorophenoxyacetic acid/kerosine)  
UN Number 1993  
DG Class 3  
Packing Group III  
Hazchem Code 2Y  
Poisons Schedule S5  
Product Use For the integrated control of Groundsel bush, Mother-of-millions, Noogoora burr, Bathurst burr and water hyacinth and other weeds as listed in the Directions for Use Table.

## Physical Data

Appearance Light straw coloured limid liquid with typical hydrocarbon odour.  
Melting Point <0°C  
Boiling Point >160°C (for solvent)  
Vapour Pressure Active ingredient considered non-volatile  
Specific Gravity 1.03 - 1.05 (1.044)  
Flash Point 40°C  
Flamm. Limit LEL No information available

## Other Properties

Volatile Component ~23%  
Autoignition Temp. No information available  
Vapour Density No information available  
Form Liquid  
Other Information Emulsifies in water.

## Ingredients

Ingredients	Name	CAS	Proportion
	2,4-Dichlorophenoxy acetic acid	94-75-7	300 g/L
	Synthetic ethoxylated alcohol	68439-46-3	50 %
	Solvent 400		235 g/L

## HEALTH HAZARD INFORMATION

### Health Effects

Acute - Swallowed A significant hazard exists if the concentrate is accidentally swallowed. Absorption of relatively large amounts of 2,4-D can produce headaches, nausea, lethargy, motor weakness and inco-ordination. The concentrate is considered harmful if swallowed, when classified according to the Worksafe Criteria.



# Material Safety Data Sheet

Page: 2 of 5

Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM

Product Name: **AF300 Herbicide**

Classified as hazardous according to criteria of NOHSC

Acute - Eye	The concentrate is irritating to the eyes. No permanent effects on the eyes is expected from a single exposure
Acute - Skin	The concentrate is irritating to the skin. Prolonged or repeated exposure may cause defatting of the skin which could lead to secondary dermatitis. Some absorption of 2,4-D acid is possible if contact with the concentrate is prolonged.
Acute - Inhaled	Inhalation of solvent may lead to headache or nausea if exposure is prolonged. Avoid breathing spray mists.
Chronic	Chronic Over Exposure: Repeated absorption of relatively large doses of 2,4-D presents a risk to the liver and kidneys.
Other Information	If poisoning occurs, contact a Doctor or Poisons Information Centre 13 11 26

## First Aid

Swallowed	<p>If swallowed do NOT induce vomiting; seek medical advice immediately and show this container or label or contact the Poisons Information Centre on 13 11 26. Make every effort to prevent vomit from entering the lungs by careful placement of the patient.</p> <p>The above first aid instructions are mandated by the Commonwealth Department of Health and Aged Care via the National Drugs and Poisons Schedule. These instructions are suitable for ingestion of spray solution and small amounts of concentrate; however, if SUBSTANTIAL AMOUNTS of the concentrate have been swallowed (more than about 50ml) AND if medical assistance is more than 30 minutes away, the induction of vomiting should be CONSIDERED, preferably based on MEDICAL ADVICE if a physician can be contacted by phone. All care must be taken to prevent vomit from being inhaled. Do not give anything by mouth to a semi-conscious or unconscious person.</p>
Eye	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open.
Skin	Wash affected areas thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
Inhaled	Remove victim to fresh air until recovered.

## Advice to Doctor

Advice to Doctor	<p>Treat symptomatically.</p> <p>Aspiration of vomitus may lead to pulmonary pneumonitis, which may be serious, especially in young children.</p>
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## Other Health Hazard Information

## PRECAUTIONS FOR USE

Exposure Limits	No exposure limits have been set for this product, however, an exposure limit has been set for 2,4-D acid (solid) at 10 mg/m <sup>3</sup>
Eng. Controls	Handle the concentrate in a well ventilated space. Natural ventilation is adequate, although a local exhaust should be provided if material is handled in confined spaces.

## Personal Protection

Protective Equip.	<p>Avoid contact with eyes and skin. DO NOT inhale spray mist. When preparing spray wear PVC or rubber apron, elbow-length PVC gloves and face shield.</p> <p>When using the prepared spray wear face shield. If product on skin, immediately wash area with soap and water. After use and before eating, drinking and smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves, face shield and contaminated clothing.</p>
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## Flammability



# Material Safety Data Sheet

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Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM

Product Name: AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

Fire Hazards Flammable 40°C (Abel L.C.) for solvent present.

## SAFE HANDLING INFORMATION

### Storage and Transport

Storage and Transport Transport Details:

Proper Shipping Name:

Flammable liquid, n.o.s. (2,4-dichlorophenoxyacetic acid)

UN No. 1993

Class: 3

Packaging Group: III

Hazchem: 2Y

FLAMMABLE

Avoid all sources of ignition including static electricity buildup during transfer operations.

Store in original container, tightly sealed, in a safe place away from seeds, fungicidal and insecticidal sprays or fertilizers.

Proper Shipping Name

FLAMMABLE LIQUIDS, N.O.S. - (2,4-dichlorophenoxyacetic acid/kerosine)

EPG Number

3A1

### Spills and Disposal

Spills & Disposal

Contain spill and absorb with sand or proprietary absorbent (vermiculite).

Prevent from entering drains, waterways or sewers.

Collect in sealed open top containers for disposal.

Triple rinse containers, add rinsate to the spray tank, then offer container for recycling/reconditioning, or puncture top, sides and bottom and dispose of in landfill in accordance with local regulations. On-site disposal of concentrate is not acceptable.

### Fire/Explosion Hazard

Fire/Explos. Hazard

Extinguishing Media: Water fog, dry chemical, foam, CO2.

Special Fire Fighting Procedures: Breathable air apparatus may have to be worn if material is involved in fires especially in confined spaces.

Keep upwind.

Unusual Fire and Explosion Hazard: May emit toxic fumes of hydrogen chloride, phosgene and carbon monoxide if material is involved in fires or subjected to extreme heat.

Hazardous Reaction

Store away from oxidising agents, may react violently with strong oxidising agents.

Polymerisation is not possible.

Hazchem Code

2Y

### OTHER INFORMATION



# Material Safety Data Sheet

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Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM

Product Name : AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

## Toxicology

2,4-D (2,4-dichlorophenoxyacetic acid)  
LD50 (oral, rat): 699mg/Kg  
LD50 (dermal, rabbit): >2,000mg/Kg  
LC50 (inhalation, rat): >1.79mg/L (4hr) (maximum attainable concentration)  
Not toxic to bees  
LC50 (rainbow trout): ~100mg/L  
LC50 (daphnia): 1.4mg/L  
LC50 (mallard duck): >5,000mg/Kg diet  
In trials using 2,4-D as a drug, studies on volunteers have shown that doses of between 5 and 36mg/Kg body weight do not cause any acute toxic effects. Formulated 2,4-D products can be absorbed by ingestion, inhalation (spray mist) and through the skin. Studies of users (sprayers) has shown that absorption through the skin is the most common route. When used with good agricultural spraying practice and good personal hygiene, absorption of 2,4-D is very low.  
2,4-D does not accumulate in the body; a single dose of 2,4-D is rapidly excreted (in a few days), mainly in the urine.  
The Australian Acceptable Daily Intake (ADI) of 2,4-D for a human is 0.01mg/kg/day, set for the public for daily, lifetime exposure. This is based on the NOEL of 1.0mg/kg/day, the level determined to show no effects during long term exposure for the most sensitive indicators and the most sensitive species. (Ref: Comm. Dept. of Health and Aged Care, 'ADI List', TGA, August 2001).

## Environ. Protection

2,4-D products do not appear to pose any threat to birds.  
2,4-D products do not appear to pose any threat to fish other than in very high concentrations.  
DO NOT spray in high winds. Do not contaminate dams, waterways or streams with this product or used containers. DO NOT use this container for any other purpose. After use, triple rinse containers, add rinsate to the spray tank, then offer container for recycling/reconditioning, or puncture top, sides and bottom and dispose of in landfill in accordance with local regulations. On-site disposal of concentrate is not acceptable.  
Equipment that has been used for this product should not be used for the application of other materials to sensitive plants, unless it has been well washed out with hot, soapy water or 1% ammonia solution, followed by several clear water rinses.  
Do not use on or in situations where damage to susceptible crop plants such as cotton, tobacco, tomatoes, flowers, vines fruit trees or other susceptible crop plants may result from direct application or spray drift.



# Material Safety Data Sheet

Page: 5 of 5

Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM

Product Name: **AF300 Herbicide**

Classified as hazardous according to criteria of NOHSC

**Pkg. & Labelling**

**WARNING**

KEEP OUT OF REACH OF CHILDREN

READ SAFETY DIRECTIONS BEFORE OPENING

Not to be used for any purpose or in any manner contrary to the label unless authorised under appropriate legislation.

The product has been assessed according to the Worksafe criteria for classifying hazardous substances and is classified as hazardous:

**Risk Phrases:**

R10 Flammable

R22 Harmful if swallowed

R36/37/38 Irritating to eyes, respiratory system and skin

R65 Harmful: may cause lung damage if swallowed

**Safety Phrases:**

S2 Keep out of reach of children

S23 Do not breathe vapour

S24 Avoid contact with skin

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S36/37 Wear suitable protective clothing and gloves

S62 If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label. Refer to First Aid section.

**CONTACT POINT**

**Contact**

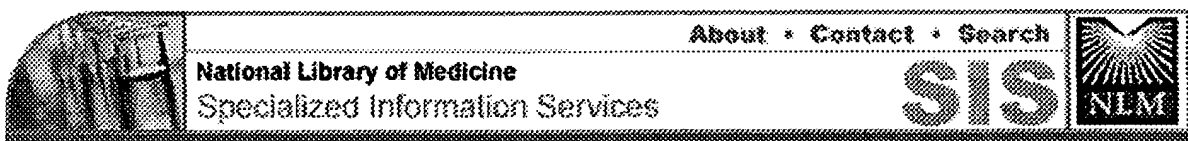
Normal Hours: Mr Volker Maier

Phone: (03) 9282 1000

After Hours: Shift Supervisor

Phone: 1800 033 498

...End Of MSDS...

**ChemIDplus Advanced**[Tox. & Env. Health](#) [TOXNET](#) [Return to Results Page](#)**C9-11 Pareth-3**  
**RN: 68439-46-3**

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**Name of Substance**

- ☐ C9-11 Pareth-3
- ☐ C9-11 Pareth-6
- ☐ C9-11 Pareth-8
- ☐ Pareth-91-3
- ☐ Pareth-91-6
- ☐ Pareth-91-8

**Synonyms**

- ☐ (C9-C11) Alkyl alcohol, ethoxylate
- ☐ (C9-C11) Alkyl alcohol ethoxylate
- ☐ Neodol 91-6
- ☐ Polyethylene glycol, nonyl, decyl, undecyl ether

**Systematic Name**

- ☐ Alcohols, C9-11, ethoxylated
- ☐ Alkyl(C9-11) alcohol, ethoxylated

**Superlist Name**

- ☐ Alcohols, C9-11, ethoxylated

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